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GREECE



DODECANESE



CRETE



FOREWORD

Greek canned fruit exports have increased rapidly since 1958, especially in the lucrative West German market, chiefly in the form of canned peaches. Greek access to this key U.S. market is aided by lower duties through associate membership in the European Economic Community, as well as proximity.

Further expansion of Greek canned fruit production is possible if some major problems can be overcome. These include: lack of production of suitable canning varieties; absence of product standardization and quality control; inadequate canning facilities; and shortage of technically trained personnel. Since the domestic market is relatively limited and will probably remain so for some time, increased production will have to be exported, thereby creating additional competition for U.S. exports.

The author visited Greece in September of 1966, in order to gain a better understanding of the canned deciduous fruit industry there, the results of which are set forth in this manuscript. He is indebted to the Greek Government and the canning industry for their cooperation. Special appreciation is extended to the U.S. agricultural attache staff in Athens, in particular Costas Athanassiadis, whose assistance made this report possible.



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THE GREEK CANNED DECIDUOUS FRUIT INDUSTRY

By Frank A. Padovano — Fruit and Vegetable Division¹

Until the late 1950's, Greek deciduous fruit production was oriented toward the fresh market, with canning little more than a surplus operation. With the maturation of increased plantings and the adoption of some improved cultural techniques, the subsequent increased production of fresh fruits has in part enabled the canned deciduous fruit industry to expand at a rapid rate between 1958 and 1966. However, despite this growth, the canning industry must still rely on production which originates in small orchards without the advantage of economies of scale, and which is not geared to processing from a varietal standpoint.

Domestic consumption of processed fruit is relatively limited mainly because of its high cost in comparison with fresh fruit, and consumer preference for

the latter. Therefore, the export market is important to the canning industry. The ensuing competition from Greek exports has become increasingly important in the key U.S. foreign market of West Germany. In this market, Greece has the advantage of lower duties because of association with the European Economic Community and also relative nearness. The degree to which Greece can increase her exports will depend in part on how rapidly canning facilities can be improved and expanded. Partly because of its ability to earn foreign exchange and provide a measure of economic development, the Greek Government has favored programs to aid the growth of this industry, in particular through cooperative endeavors at both the farm and factory level.

FRUIT PRODUCTION

Farm size and value

According to the most recent Greek Agricultural Survey, taken in 1961, which categorizes land by use, the area devoted to all types of tree plantations was 1,441,700 acres or 16 percent of the total 9,076,800 cultivated acres.

Most Greek deciduous fruit orchards are privately owned; they range from less than 0.5 acre to 12.4, with the average size 3.7 acres. Because of their small size and resultant inability to produce economies of scale, they are generally considered inefficient relative to orchards in the major producing countries.

Depending on such factors as location, age, and the like, the average value of Greek orchards has been estimated at \$2,000–\$2,700 per acre (1966). By comparison, uncovered land (no planted crops) has an average value of \$400–\$670 per acre. This uncovered land is considered, by the Ministry of Agriculture, suitable for the planting of orchards.

Production

The area of Macedonia in northern Greece is the most important region for production of deciduous fruits, except for apricots. The major portion (75–80 percent) of apricot production is located in the southern portion of the country known as the Pelop-

onnese, specifically in the area between Korinth and Nafplion.

Greek production of fresh apples, apricots, cherries, peaches, and pears has been on a general upward trend because of increased plantings and some improved cultural practices. In all cases, 1966 production equaled

Table 1.—GREECE: Production of fresh deciduous fruit, average 1960–64, annual 1958–66

Year	Apples	Apricots	Cherries	Peaches	Pears
	<i>1,000 Short tons</i>	<i>1,000 Short tons</i>	<i>1,000 Short tons</i>	<i>1,000 Short tons</i>	<i>1,000 Short tons</i>
Average:					
1960–64	143	18	14	79	46
Annual:					
1958	102	10	11	45	40
1959	132	18	11	67	46
1960	100	12	10	67	38
1961	139	20	13	83	44
1962	155	18	15	76	38
1963	146	13	13	63	50
1964	176	26	19	104	59
1965	183	22	18	103	50
1966	183	29	24	105	61

Source: Ministry of Agriculture, Greece.

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the previous record or set a new one. Apples are the largest single item, totaling 183,000 short tons in 1966 compared to the 1960-64 average of 143,000 tons. According to 1965 data, Imathia district, which is located in the north-central portion of the country, produced 44 percent of the crop. Pella district, located just north of Imathia and bordering Yugoslavia, was the second largest producer, accounting for 17 percent of the apple pack.

Peach production, which has remained relatively constant between 1964 and 1966, was 105,000 tons in 1966—more than twice the 1958 quantity. Again, Pella and Imathia districts were the major producers in 1965, accounting for 41 and 39 percent respectively.

Pear production in 1966 was 61,000 tons—2,000 tons above the previous record set in 1964. A breakdown of production by district was not available for pears, but output is concentrated in northern Greece.

Table 2.—GREECE: Production of selected fruits by district, 1965¹

District	Apples	Apricots	Peaches	Total
	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Akhaia	1,500	—	1,500	3,000
Argolis	—	7,300	—	7,300
Arkadhia	5,000	—	—	5,000
Attica	—	300	—	300
Dodecanese	—	700	—	700
Evvoia	—	1,300	200	1,500
Florina	4,600	—	—	4,600
Fthiotis	3,000	—	200	3,200
Ilia	—	—	600	600
Imathia	81,000	—	40,400	121,400
Kastoria	2,100	—	—	2,100
Kavalla	3,500	—	1,100	4,600
Kerkira	2,000	—	300	2,300
Khalkidhiki	—	600	300	900
Kiklaohes	—	500	—	500
Korinthos	2,500	8,200	300	11,000
Kozani	3,000	300	2,400	5,700
Lakonia	1,100	—	—	1,100
Larisa	9,000	—	1,300	10,300
Magnissia	11,900	1,000	1,500	14,400
Pella	30,300	300	42,300	72,900
Pieria	2,000	—	1,200	3,200
Serrai	2,500	500	1,800	4,800
Thessaloniki	2,000	1,000	800	3,800
Trikkala	1,000	—	—	1,000
Yiannitsa	15,000	—	6,800	21,800
Total	183,000	22,000	103,000	308,000

¹ Production of less than 100 tons is not included.
Source: Ministry of Agriculture, Greece.

Apricot production in 1966 was 29,000 tons—almost threefold the 1958 level and well above the 1960-64 average of 18,000 tons. The major apricot producing districts are Korinthos and Argolis, both located in the Peloponnese. Combined, these two districts produced more than two-thirds of the 1965 fresh apricot pack.

Cherry production also showed substantial increases from earlier levels, reaching 24,000 tons in 1966, or more than twice the 1958 figure. Data indicating cherry production by district were not available.

Tree numbers and varieties

Greek statistics for 1965 indicate that the deciduous fruit tree population was greatest for apples, followed by pears, peaches, and apricots. There were 6.1 million apple, 5.7 million pear, 3.4 million peach, and 1.1 million apricot trees. Of the total amount of apple trees, 89 percent were bearing, while for pears the figure was 83, for peaches 74, and for apricots 72.

The predominant apple varieties grown in Greece are the Belfort and the Delicious; combined, they represent more than two-thirds of the tree population. For pears, the major variety is Crystali, which accounts for 28 percent of the bearing trees.

At the time of this survey, peach production was exclusively comprised of freestone varieties. Although peach statistics do not clearly indicate the major varieties, interviews revealed that Elberta and Hale were the dominant ones. In addition, they were the most important varieties used for canning.

The principal apricot variety is the Hasiotiko and accounts for 20 percent of the bearing trees. The Hasiotiko is also the major variety canned.

Planting

Tree planting density varies according to the age of the orchard, type of fruit, and the like. In the past, orchard plantings were mixed; however, the new ones are basically solid. In many of the older peach orchards, density was generally 240 trees per acre. Now, however, the newer orchards are planted at the rate of 120-140 trees per acre, with the latter the predominant figure. Future clingstone peach planting will range between 95 and 120 trees per acre. New plantings are shifting to an Italian system known as Palmetta which will be covered subsequently.

Apricot plantings generally number 200 trees per acre. In the older orchards, apricots were often mixed with citrus; however, in the newer orchards there is less mixing. While it takes 5 to 7 years for trees to get into full production, in the case of varieties that fruit at an early age farmers plant as many as 300 trees per acre to get an economic return in three years. Eventually, they do reduce the number of trees to 200 per acre.

Table 3.—GREECE: Number of bearing and nonbearing trees, by variety, 1965

Type	Bearing	Nonbearing	Total	Percentage bearing to total
	<i>Number of trees</i>	<i>Number of trees</i>	<i>Number of trees</i>	
Apples:				
Stark Delicious	400	16,400	16,800	2
Delicious	1,557,900	374,400	1,932,300	81
Golden Delicious	87,400	100,000	187,400	47
Fikiri	750,700	42,700	793,400	95
Ben Davis	204,800	38,200	243,000	84
Bellfort	2,158,200	58,400	2,216,600	97
Others	684,200	66,500	750,700	91
Total	5,443,600	696,600	6,140,200	89
Pears:				
Bosc				
William				
Giulio Guyot	¹ 253,000	309,000	562,000	45
Santa Maria				
Gentil Bianca				
Curee				
Monsallard				
Giffard	² 166,000	52,000	218,000	76
Clario				
Packham Triumph				
Crystali	1,338,000	360,000	1,698,000	79
Condula	64,000	55,000	119,000	54
Other local varieties	2,950,000	194,000	3,144,000	94
Total	4,771,000	970,000	5,741,000	83
Peaches:				
Madeleine Pouyet				
Springtime				
Cardinal				
Earligold				
Blazing Gold	³ 493,000	524,000	1,017,000	48
Dixired				
Coronet				
Jerseyland				
Redhaven				
Golden Jubilee				
Triogen	⁴ 538,000	189,000	727,000	74
Southland				
Fairhaven				
Redglobe				
Elberta				
J. H. Hale	⁵ 1,482,000	155,000	1,637,000	90
Others				
Total	2,513,000	868,000	3,381,000	74
Apricots:				
Tyrens ⁶	47,000	135,000	182,000	26
Diamantopoulos ⁷	37,000	4,600	41,600	89
Hasiotiko ⁸	167,000	83,000	250,000	67
Luiser	51,000	24,000	75,000	68
Paviot				
Other local	525,000	62,000	587,000	89
Total	827,000	308,600	1,135,600	73

¹ Being introduced at present. ² Reportedly not propagated any longer. ³ Very early varieties; ripen between May 30 and July 15. ⁴ Late varieties; ripen between August 6 and September 15. ⁵ Mid-season varieties; ripen July 16 and August 5. ⁶ Entirely new orchards, very early; ripen between May 25 and June 16. ⁷ Ripens between May 10 and 20. ⁸ Ripens between June 20 and July 10. Source: Ministry of Agriculture, Greece.

In the past, there had been little removal of old trees when planting new ones, and also lack of incentives to plant new and better varieties.

Apple orchards are being planted between 130-140 trees per acre with some of the large varieties planted at about 100 trees. Reportedly, the Golden Delicious variety is planted as heavily as 160 trees per acre. The planting of pear trees ranges between 120-200 trees per acre.

Official sources reported that the average number of trees per acre for the entire country was 90 for apples and apricots, 135 for pears, and 175 for peaches. However, these figures varied in different parts of the country.

As previously mentioned, the Palmetta planting system was being adopted by many farmers, for all deciduous fruit trees except apples, at the time of the survey. Although it is not the predominant system yet, it is the preferred one. New plantings are trained on a wire and eventually resemble a hedgerow instead of an oval or vase-like shape. In addition to and as a result of adapting itself better to mechanization, and easier cultivation, spraying, and harvesting techniques, the Palmetta system reportedly returns quicker profits.

Climatic factors

Though the average annual rainfall is 25 inches, irrigation is essential because of the seasonal distribution of the rainfall. In northern Greece, irrigation generally begins at the end of May and terminates approximately in mid-December. Water is obtained from artesian wells, mechanical pumps, and canals (sometimes made of cement). Most orchards are irrigated 3 to 5 times per year. Reportedly, there is a tendency to over-irrigate when there is an abundance of water.

In the Peloponnese, orchards are generally irrigated 5 or 6 times per year. Irrigation in this area usually begins earlier than in the north because the climate is more arid. All irrigations are surface and are handled either by a flooding system or a spot one. A spot system is used during periods of water shortages, and only the area near the tree is irrigated as opposed to the whole orchard.

In northern Greece, especially around Thessaloniki, frost has been a problem for deciduous fruits during the past ten years. Smudge pots and other such equipment have not been used because of the high cost of fuel, and as a result frost has remained a problem.

Fertilization

According to the Ministry of Agriculture, chemical fertilizers are applied at the rate of approximately 490

It was stated that under this method peach trees could pay back all costs in 3 to 4 years of bearing, while under the normal system it would take 5-6 years.

However, it was further reported that the commercial life was not as long under the Palmetta system. The commercial life of various trees in Greece is 15-18 years for peaches; 20 for apricots; 30-40 for apples; and 40 plus for pears.

Yields

Greek yields per acre compare favorably to those of other producing countries, in part because of heavy plantings. The following figures obtained from the Ministry of Agriculture are yields which reportedly cover approximately 70-75 percent of Greek production:

	Tons per acre
Apples	12.5-16.0
Apricots	4.5- 6.7
Peaches	11.0-13.5
Pears	11.0-12.5

CULTURE

lb. per acre. The ration of nitrogen, phosphorus, and potassium is generally 4-3-4. Reportedly, the Ministry will recommend the use of fertilizers containing larger quantities of nitrogen. In some cases, farmers use only nitrogen fertilizers, supplying half the requirements before the bloom, and half after the fruit has formed.

At the time of this study, fertilizers were not subsidized. However, the Ministry of Agriculture is the only seller of fertilizer in the country, and it reportedly maintains prices at reasonable levels which have not changed since 1960.

Thinning

Reportedly, thinning of fruit is not widely practiced in Greece. Most of the thinning which takes place is for peaches and apricots; this may range between 5 and 10 percent of the fruit. Any thinning which does take place is performed by hand. There are no specific canner or government programs which offer monetary incentives for the thinning of fruit. However, some officials interviewed believed that thinning will probably be increased in the future.

Cultivation and spraying

Approximately three-fourths of the deciduous fruit orchards in Greece were reported to be under cultiva-

tion, mostly by mechanical means. Cultivation is generally carried out twice each year, once in the spring and once in the fall. Spraying practices are in-

creasing throughout the country, nearly all performed by a hand-operated machine loaded on the back of a moving truck.

Table 4.—CHEMICAL FERTILIZERS: Sales prices to Greek farmers, 1966

Fertilizer	\$U.S. per Short ton
Ammonium calcium nitrate (imported 20.5%) . .	44
Do (imported and domestic 26.5%) . .	54
Ammonium nitrate (imported and domestic)	62
Ammonium phosphate (imported and domestic) . .	68
Ammonium sulfate (imported and domestic)	44
Ammonium sulfonitrate (imported)	52
Calcium nitrate (imported)	40
Chilean nitrate	64
Mixed 4-8-8 (domestic)	40
Do 4-8-12 (imported)	44
Do 5-10-10 (domestic)	44
Do 6-8-8 (domestic)	44
Do 7-9-9	44
Do 8-16-16 (domestic)	68
Do 11-15-15	72
Do 22-22-0 (imported)	76
Potassium sulfate (imported)	50
Sodium nitrate (imported)	44
Superphosphates (imported)	66
Do 0-16-0 (domestic)	22
Do 0-18-0 (domestic)	26
Do 0-18.5-0 (imported)	26
Do 0-19-0 (imported)	26
Do 0-20-0 (domestic)	26
Do 0-21-0 (domestic)	26
Do 0-44.5-0 (imported)	66
Do 0-45-0 (imported)	66
Do 0-45.5-0 (imported)	66
Do 0-46.5-0 (imported)	66
Urea (imported)	84

Source: Agricultural Bank of Greece.

Pests, diseases, and deficiencies

In the Naoussa area of northern Greece, the soil of some orchards has a high calcium content and an iron deficiency. There are also some small-scale deficiencies of zinc, but there are at present no serious problems with pests and diseases. Evidently, farmers are aware of the benefits of good control practices and methods, and have successfully employed them where a problem existed. No specific problems of any magnitude were reported in the Peloponnese.

Most people interviewed stated that the Greek deciduous fruit industry does not have any serious problems arising from diseases and pests. However, the principal ones identified are listed below:

Type	Apples	Apricots	Peaches	Pears
Aphids	x	x	x	x
Apple curculio	x			
Apple weevil	x			
Brown rot	x	x	x	x
Codling moth	x	x	x	x
Coryneum		x	x	
Lace bug	x			
Leaf miners				x
Leaf rollers		x		
Mediterranean fruit fly			x	
Over wintering insects	x	x	x	x
Pear weevil				x
Powder mildew	x	x		
Rusts				x
Scab	x			x
Scale insects	x	x	x	x
Septoria				x
Spider mites	x	x	x	x
Stink bugs	x	x		
Thrips	x			
Weevil	x	x	x	x

Source: Agricultural Bank of Greece.

HARVESTING AND TRANSPORTATION

Almost all harvesting is done by hand. Migratory labor, similar to the type which exists in the United States, traveling to various areas of the country according to timing of crop production, is not found in Greece because of the relative smallness of the country. However, if there is a scarcity of local labor because of the short harvest season, labor, if available from another section of the country, is brought in to com-

plete a job and then is returned to its point of origin.

Reportedly, about 85 percent of the harvested fruit moves from the farm to the plant by motorized methods. The remainder arrives by horse or donkey-drawn carts. However, the receiving of fruit at the processing plant varies because sometimes the farmer harvests and delivers it himself, and at other times the canner goes into the field to harvest it.

GROWER COSTS AND INCOME

Grower prices

Since the turn of the decade, average Greek grower prices have fluctuated greatly for apples, apricots, and pears and to a lesser extent for peaches. Since production has not been so varied, this seems to suggest that other forces such as poor dissemination of crop estimate information, and uncertainty of market conditions, are important factors affecting these prices. Average grower prices¹ between 1960 and 1966 are given in the following table:

	Apples	Apricots	Peaches	Pears
	<i>\$US per</i>	<i>\$US per</i>	<i>\$US per</i>	<i>\$US per</i>
	<i>short ton</i>	<i>short ton</i>	<i>short ton</i>	<i>short ton</i>
1960	64	154	34	132
1961	52	68	34	74
1962	48	80	52	94
1963	60	92	52	94
1964	52	84	48	98
1965	80	134	48	126
1966	78	104	80	128

¹ Converted at exchange rate of 1 drachmae = \$US 0.0333.
Source: Ministry of Agriculture, Greece.

Costs of production

Cost of production figures vary, depending on commodity, size of farm, location, and other factors. Costs per acre for a peach orchard in Pieria, containing 200 trees, during the crop year 1964-65 totalled \$425.73, with labor and materials the largest cost items at \$154.11 and \$92.81, respectively.

Table 5.—GREECE: Cost of production for peaches in Pieria, Greece, 1964-65

Type of expense	Total cost
	<i>U.S. dol.</i> <i>per acre</i>
Labor:	
Pruning	32.05
Plowing	1.34
Rotary Tilling	2.67
Fertilization .....	.80
Irrigation	16.02
Cultivation	4.27
Disease control	10.68
Harvesting	84.14
Transportation	(1)
Grading and packing	(1)
Inspection and filling of fly traps	2.14
Total	<u>154.11</u>

Materials:

Fertilizer	22.03
Chemicals	45.41
Diesel fuel	21.63
Other oil (car)	3.47
Grease .....	.27
Total	<u>92.81</u>

Maintenance and repairs:

Land reclamation .....	.40
Building storage .....	.40
Equipment, tractor, rotary tiller	2.27
Cost of implements	3.34
Total	<u>6.41</u>

Depreciation:

Cost of orchard up to bearing time	20.57
Land improvement .....	.80
Buildings .....	.93
Equipment	11.35
Implements	16.69
Total	<u>50.34</u>

Taxes and interest:

Sales tax	28.18
Interest on non-fixed investments	9.48
Interest on fixed investment	13.35
Total	<u>51.01</u>

Other charges:

Rent of land	53.42
Administration charges	17.63
Total	<u>71.05</u>

Grand total

425.73

Note: Converted at exchange rate \$U.S. 0.0333 = 1 drachmae. ¹ Not available. Source: Agricultural Bank of Greece.

Wages

Some official statistics of wage rates obtained from the Greek Ministry of Agriculture, by type of work, are indicative of fruit farm wages:

	<i>Daily rate¹, 1966</i>
	\$US
Pruner	4.95-5.95
Digger	2.65-3.30
Sprayer	2.95-3.65
Harvester, female	1.65-2.30
Harvester, male	2.20-2.95

¹ Converted at exchange rate \$US 0.0333 = 1 drachmae.

GOVERNMENT INCENTIVES

Production subsidies to farmers are permitted under Law 4035 which was passed in 1960. While these subsidies apply to all Greece, it was reported that they were functionally most important in northern Greece, in the Macedonia area.

At the time of this survey, the following subsidies were reported in effect:

1. Pest control subsidies for up to 50 percent of the pesticide cost. Reportedly, many farmers received between \$4.40 and \$9.35 per acre as a pesticide subsidy. However, the Greek Government will cease this subsidization and instead offer a subsidy on dusting and spraying equipment. Under this program, farmers who consolidate or pool their orchard land with others (but still hold title to it) will be able to obtain a credit of 50 percent of the cost of mechanical spraying equipment.

2. The Greek Government is now trying to promote certain fruit varieties, including those suitable for canning. The underlying objective of this system is to lengthen the harvesting season and thus avoid peak periods which have plagued the fruit industry. If a grower plants the recommended variety, he can get a credit of up to 50 percent of the cost of new trees. In these cases, the government supplies the trees to the nurseries, which in turn supply them to the growers. The stipulation for subsidy eligibility is that the grower obtain and plant the specified varieties at specified times.

3. In 1965 (for the first time) a subsidy was given to farmers who installed the Italian planting system, known as Palmetta. It reportedly amounted to 100 percent of the cost of plowing and 50 percent of the cost of poles and wires, or a total credit of approximately \$107 per acre. Some sources felt that this covered 80 percent of the installation cost of the Palmetta system.

4. At the time of this study, a subsidy was given for deep plowing. In such cases, a grower received approximately \$40 per acre plowed to a depth of 3 feet.

5. The Greek Government is also subsidizing irrigation. Again, if farmers consolidate their land, they can receive subsidies in the form of credit amounting to 50 percent of the irrigation equipment cost.

6. A subsidy on tractors of 5–30 horsepower is also available. For farmers who consolidate, this amounts to 50 percent of the cost, but it is only 25–30 percent for those who do not.

7. The Greek Government maintains another form of subsidization which concerns minimum grower prices for some canning fruit. Under this system, each processing plant is required to prepare a list of growers who have delivered fruit and the respective prices paid. After certification, this list is sent to the Ministry of Commerce for final approval. Subsequent to such action, the Agricultural Bank is then allowed to make payments to growers for their claims on minimum prices.

At the time of this study, officials discussed the possibility of granting more subsidies to aid growers. One involved credit toward the purchase of smudge pots to help prevent cold weather damage, which reportedly had been a recent problem. This subsidy may amount to 50 percent of the cost. Another subsidy pertained to the drilling of artesian wells for irrigation. It was thought that the government would perform the actual drilling and the farmer would then pay a nominal charge for the service. Both subsidies would probably be important with the greatest benefit coming from the former.

In the past, planting subsidies for early variety freestone peaches were eliminated because production became adequate. Originally, some of these early varieties were programmed for a 5-year subsidy. In relation to this program, some growers complained that once an adequate level of planting had been obtained, the program was not terminated soon enough and overproduction resulted; this in turn led to an eventual drop in grower prices. However, these same people noted that the program had experienced some success in extending the peach harvesting and marketing periods. In addition, they mentioned that a subsidy program for early Tyrens apricots terminated because it was deemed that enough expansion had taken place.

Concerning clingstone peaches, a formal program had not been initiated at the time of this study. However, plans include the subsidization of suitable California varieties. It was further revealed that the government may begin to encourage the planting of Bartlett pears in 1967.

PROCESSING

Canned fruit production

Greek canned deciduous fruit production has expanded greatly in recent years, rising more than

fourfold from 152,000 cases in 1958 to 632,000 in 1966. Peaches are the largest single item packed, accounting for 48 percent of the total in 1963; 59 percent in 1964; 91 percent in 1965; and 46 percent in

1966. Apricots, the second biggest item, accounted for 44 percent of the 1966 total. Reportedly, other canned fruit consists mainly of cherries.

Table 6.—GREECE: Production of canned deciduous fruit, 1958-66

Year	Peaches	Apricots	Other	Total
	<i>1,000 cases</i>	<i>1,000 cases</i>	<i>1,000 cases</i>	<i>1,000 cases</i>
	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>
1958	(¹)	(¹)	(¹)	152
1959	(¹)	(¹)	(¹)	141
1960	(¹)	(¹)	(¹)	175
1961	(¹)	(¹)	(¹)	217
1962	(¹)	(¹)	(¹)	287
1963	222	90	² 152	464
1964	316	199	² 24	539
1965	524	30	² 24	578
1966	290	281	² 61	632

¹ Not available. ² Other fruits are assumed to be mostly cherries.

Source: Ministry of Agriculture, Greece.

Plants

A major portion of the fruit and vegetable processing industry consists of small single-plant firms, which are either cooperatives, corporations, or personally owned. At the time of this study, plant managers interviewed stated that most Greek plants were not operating at full capacity. Depending on the commodity, operations ranged between 30 and 50 percent of present capacity. This low utilization stems, in great part, from the previously mentioned lack of adequate supplies to process. Peaches typify this condition, since canneries are able to secure sufficient quantities only during periods of gluts on the fresh market.

Another frequently mentioned problem concerned plant location in relation to present production patterns. Although motorized transportation is often used, poor roads contribute to slowness of delivery and the fruit losses that ensue through deterioration. This, in part, contributes to the low processing efficiency. However, it was stated that processors were increasing their use of central collection points from which trucks could bring in raw material, a method designed to improve delivery time.

Raw material

Many of the problems which currently face the Greek fruit canning industry appear to revolve around adequate supplies and suitable canning varieties. The industry is basically a salvage industry, meaning that

such production is based on a surplus condition. Peaches exemplify this situation. As recently as 1966, the peach crop consisted solely of the freestone variety, primarily a fresh table peach. Since peach growers had the alternative of selling their product in one of two markets, fresh or processed, canners could not obtain adequate supplies except when fresh market prices were lower than those for canning.

The application of contracts to assure supplies has been of limited usefulness. A frequently stated complaint was that growers would not abide by their contracts when the price in the fresh market was higher than that specified in the canning contract. Although the growers were legally obligated by the contract, canners often did not go to court over violations, reportedly because of political considerations as well as the fear of alienating the sources of future supplies. On the other hand, growers complained that the minimum prices, established by the government and in some cases specified in the contracts, were too low and not realistic. In addition, grades were not always specified in these contracts.

Concerning varieties, in 1966 there was no production of clingstone peaches or Bartlett pears considered preferable for canning. However, as previously mentioned, the government planned to subsidize the planting of suitable canning varieties.

Labor

One of the most serious problems of the Greek canning industry is a shortage of personnel adequately trained technically. This fact applies to various phases of plant operations. Many managers appeared to have a general understanding of the plant operations, but apparently lack the technical skills needed to overcome many of the specific problems encountered daily. In addition, a scarcity of mechanics has forced several of the plants visited to require special mechanical assistance from some of the more industrialized European countries, such as Germany and Italy. This particular inadequacy was in part responsible for work stoppages and the resultant wastage of personnel and productiveness. Contributing to this condition is the lack of suitable vocational training schools and the flight of better trained labor to countries providing greater job opportunities.

Another aspect of this problem is the shortage of trained personnel to handle agricultural marketing problems. This shortcoming has been attributed in part to the lack of a good system for disseminating economic information as well as an absence of sufficient agricultural economics instruction.

While there is a shortage of trained personnel, needless amounts of unskilled labor are often employed. This raises costs through needless duplication and expenditure of resources which could be used

elsewhere. Aggravating this condition is the lack of ample supplies to process. These factors directly influenced the industry's ability to adopt technological innovations and compete effectively.

Machinery

In 1966, there were approximately 18 large firms (with one or more plants) and roughly 60 small firms scattered throughout the mainland and the islands. At first, private canneries were family-owned, but recently, many of these operations have expanded to the point where they now need to be operated by well-trained managers. Most plants are only semi-automatic, and therefore rely heavily on hand labor. The lack of well-trained personnel and modern machinery is responsible for many of the quality-control and product-uniformity problems which face the processing industry.

To overcome this situation rapidly, some plants are attempting to pack for well-known foreign brands. In such cases, the foreign firm may supply many technical and managerial services to insure that the local plant can meet the brand's standards.

To encourage the use of new machinery (as well as to increase economic development), the Greek government has allowed firms to import machinery duty-free if the plant is located outside of Athens. However, at the time of this survey it was not certain how long this regulation would continue. Used equipment cannot be imported into Greece, according to Government sources.

According to Greek import statistics, machinery for processing fruits and vegetables in general comes from Italy, Germany, the United Kingdom, Cyprus, France, and the United States. Italy is the biggest supplier of tomato packing equipment, while Germany and France provide a great deal of machinery for canning other vegetables. In these lines, U.S. prices were considered prohibitive, partly because of lower import duties on products from Common Market countries, and also because of higher transportation costs as compared to those on European equipment. However, for fruits, much of the equipment imported is of American origin because of its superior quality. As an example of the Common Market duty preference, machinery for preparing fruits and vegetables in such processes as peeling, shelling, removing stalks, pitting, and the like, an import duty of 3.5 percent must be paid, while on machinery from third countries the duty is 6.5 percent, nearly twice the former amount.

Processing costs

Processing costs for a plant canning apricots, and another canning peaches, showed the former at \$5.62 per case, the latter \$5.19, C & F France. In both cases, the raw material was the most expensive item, and

coupled with the cost of the tin containers accounted for over 60 percent of the f.o.b. price.

Table 7.—GREECE: Canned fruit, cost of processing for shipment to France, 1966

Item	Apricots	Peaches
	<i>U.S. dol.</i> <i>per case</i> <i>(24/2½'s)</i>	<i>U.S. dol.</i> <i>per case</i> <i>(24/2½'s)</i>
Processing Costs:		
Raw material	1.66	1.44
Sugar .....	.54	.37
Caustic soda ..	—	.07
Citric acid	—	.03
Tin container	1.33	1.33
Labels .....	.10	.10
Cartons .....	.17	.17
Processing labor .....	.79	.58
Fuel .....	.06	.06
Electricity .....	.02	.02
Other .....	.16	.16
Total f.o.b. cannery	<u>4.83</u>	<u>4.33</u>
Shipment to point of export:		
Freight	<u>1.05</u>	<u>2.13</u>
Total FAS	<u>4.88</u>	<u>4.46</u>
Shipment to France:		
Loading .....	.01	.01
Interests and commissions ...	.10	.10
Port expenses .....	.07	.07
Freight .....	.40	.40
Representative commissions..	.16	.15
Total c&f France	<u>5.62</u>	<u>5.19</u>

¹ To port of Aegion. ² To port of Thessaloniki.

Source: Greek trade contacts.

Cans

Tin cans have been expensive because of freight, duties, inefficient production, and the use of lithographs instead of labels. In addition, glass jars have not been used extensively because they were not suitable for sterilization temperatures. While improvements have been brought to this sector and costs have decreased, tin cans are still a relatively high cost item.

In 1966, there were two can producers in Greece and in addition two canneries which made their own cans. Basically, 12 different sizes were produced; however, the most important were the 1 kilo (35.3 ounces) for fruits and vegetables, and the No. 2 for juices.

Greek can production conforms to international standards, although there are no domestic regulations

which control such production. Reportedly, Greek cans are competitive, in both quality and price, with those produced in other Mediterranean countries. At present, Greece is importing primary tinplate used for can making; however, development plans call for production from within the country. The major sources for Greek tinplate are the United Kingdom, Germany, Austria, Belgium, and France. Some small quantities

are provided from the United States, Canada, and Italy.

Imported tinplate to be used to produce cans that are eventually exported is not subject to import duties. A 1-kilo can which is used for export costs approximately \$0.055, while one used for the domestic market costs about \$0.065. In similar uses, a ½ kilo can costs \$0.035 and \$0.045, respectively.

EXPANSION

Cooperative vs. private canneries

Interviews with various public and private officials revealed that the Greek government favored the development of government-backed cooperatives rather than private canneries. It appears that the Agricultural Bank of Greece is more inclined to make loans and to extend credit to cooperative ventures than to private ones. The credit terms and arrangements in such cases are generally much more favorable than those a private cannery or firm can obtain from normal commercial credit sources, as illustrated by the following rates of interest on loans made by the Agricultural Bank of Greece:

Type of loan	Type of debtor		
	Individual	Cooperative	Union of cooperatives
	% rate of interest ¹	% rate of interest ¹	% rate of interest ¹
Short-term (1 year)			
Normal ²	5	4¼	4
Collateral ²	6	5¼	5
Medium-term (2-3 years)			
Normal	4	3½	3½
Long-term (12-15 years)			
Normal	4	3½	3½

¹ Rates in effect September 9, 1966. ² Rate for an overdue loan, 7 percent.

The amount of credit a cooperative can obtain from the Agricultural Bank varies according to the type of loan. If the cannery is to be a joint venture with the Bank, the Bank finances 51 percent of the investment. If the investment is not a joint venture, then the Bank supplies 60 percent. In each case, the remainder is financed by the producer union which either has its own finances or uses conventional sources. In the latter case, the Bank has the right to partake in management decisions until the loan is repaid.

Some public officials did not appear enthusiastic about the prospect of direct foreign investment. Rather, they were more receptive to portfolio investments or to projects which would enable local Greek firms to produce a portion of a foreign company's international requirements. At the time of these interviews, it was learned that this type of venture had been initiated and it was expected to become more pronounced in the years to come. This situation, in part, may stem from Greece's association with the European Common Market and the preferential duty treatment products of Greek origin would receive.

Interviews with non-government personnel revealed a feeling that, despite the partiality to cooperatives, private canneries would also develop in the future. A problem facing the private sector is that many of the existing factories are old and do not possess as much modern equipment as some of the newer cooperatives. However, a few of the more recent private ventures are equipped with modern machinery and appear to be less burdened with the problem of bureaucracy and its costly red tape.

Planning

Concerning the coordination of planning, enough studies have been made so that both the Greek Government and the Greek canning industry are aware of the problems which face this sector. In addition, these studies have yielded what are generally accepted as good recommendations to overcome most of these difficulties. However, while long-run plans appear to concern themselves with seemingly adequate programs, there is a definite lack of good immediate implementation. The financing of some agricultural projects is an indication of the lack of coordination for direction of development activities. A great deal of the credit extended for these projects originates from the Agricultural Bank of Greece which is a branch of the Ministry of Agriculture. However, the Ministry must obtain its funds from the Agricultural Bank, and at times, some projects which the Ministry would like to initiate do not coincide with those of the Agricultural Bank.

There is also the problem of proper orientation of

research programs which seem to be concentrated on the development of the most modern type of equipment and technology rather than implementation of immediately productive procedures. In this light, some sources

felt that the present state of the Greek canning industry was not industrially mature enough to adopt many of the highly mechanized procedures found in the United States and Western Europe.

MARKETING

Trade

It appears that Greek canned fruit exports are mostly for the European market, in particular West Germany. According to the latest Greek export statistics in 1964, West Germany was the outlet for 80 percent of Greek canned fruit exports followed by the Netherlands with 10 percent, Belgium-Luxembourg 3, and the United Kingdom 2. Combined, these four countries accounted for 95 percent of the total shipments that year. West Germany became the predominant foreign market in 1961 when it imported over 42 percent of total Greek shipments. This figure increased to 65 percent in 1962 and 73 percent in 1963.

German import statistics reveal that though shipments from Greece attained a peak in 1964, they represented only 4 percent of German canned fruit imports that year. In 1966, Greek canned fruits constituted only 3 percent of German imports. According to Dutch statistics, Greek exports were 2 percent of total canned fruit imports into the Netherlands in 1966, compared to 4 percent in 1965 and 2 percent in 1964. In the United Kingdom, Greek exports never amounted to more than 1 percent of the canned fruit imports.

Peaches are by far the major Greek canned fruit export item. Of 1966 German imports of Greek

canned fruit, peaches represented 93 percent, totaling 215,000 cases. One year earlier, they had totaled 250,000 cases, 92 percent of the total. However, in terms of German canned peach imports from all countries, Greek shipments represented only 7 percent in 1966 and 6 percent in 1965. Partly responsible for the decline of Greek peach imports were the increased marketing from Australia and South Africa, and an overall drop in German imports.

Most Greek processors sell their exports directly to importers in the country of destination. Some contracts have been made with big chain stores in consuming countries; however, the bulk of sales move through importers. In addition, there is very little promotional work in foreign markets on the part of individual Greek firms.

Export shipments of processed fruit are generally moved by sea; however, some previous studies have indicated that ocean companies in the past did not like to stop in Greece for several reasons. They listed inadequate dock facilities, small loads, and lack of advance export arrangements as the major complaints. Some exports from northern Greece to nearby countries travel by rail, and although the rates are reportedly lower than ocean rates, this method of transportation does not absorb a large portion of Greek canned fruit export movement.

Table 8.—GREECE: Imports of canned fruit¹ into specified countries by country of origin

Calendar year	Germany			Netherlands			United Kingdom		
	Greece	Other	Total	Greece	Other	Total	Greece	Other	Total
	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>
	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>	<i>24/2½'s</i>
1958 ..	(²)	2,010	2,010	(²)	296	296	(²)	11,300	11,300
1959 ..	(²)	2,764	2,764	(²)	324	324	(²)	10,570	10,570
1960 ..	(²)	3,066	3,066	(²)	376	376	(²)	12,388	12,388
1961 ..	14	4,722	4,736	(²)	497	497	(²)	13,140	13,140
1962 ..	44	7,002	7,046	1	631	632	9	14,369	14,378
1963 ..	62	7,151	7,213	5	723	728	5	14,196	14,201
1964 ..	328	7,235	7,563	18	871	889	11	14,134	14,145
1965 ..	273	8,992	9,265	46	996	1,042	8	13,403	13,411
1966 ..	231	6,768	6,999	27	1,078	1,105	10	14,835	14,845

¹ Excludes pineapple and citrus. ² If any, included in other countries.

Source: Commonwealth Secretariat, Official German and Dutch trade statistics.

Table 9.—GREEK CANNED FRUIT: Imports, by type, into Germany and the Netherlands

Calendar year	Germany			Netherlands		
	Peaches	Other	Total	Peaches	Apricots	Total
	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>
1958	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
1959	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
1960	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
1961	3	11	14	(¹)	(¹)	(¹)
1962	20	24	44	—	1	1
1963	47	15	62	2	3	5
1964	270	58	328	6	12	18
1965	250	23	273	41	5	46
1966	215	16	231	25	2	27

¹ Greek imports not shown separately.

Source: Official German and Dutch trade statistics.

Table 10.—WEST GERMANY: Imports of canned peaches, by country of origin

Country of origin	1960	1961	1962	1963	1964	1965	1966
	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>	<i>1,000 cases</i> <i>24/2½'s</i>
Argentina	54	126	2	83	213	96	10
Australia	—	(¹)	5	(¹)	20	339	677
Bulgaria	2	6	59	219	176	410	205
Greece	—	3	20	47	270	250	215
Italy	(¹)	2	3	(¹)	7	66	91
South Africa	10	(¹)	35	110	238	20	304
Spain	60	83	139	83	128	216	60
United States	1,292	1,977	3,002	2,697	2,167	2,590	1,664
Other	54	31	131	25	13	35	7
Total	1,472	2,228	3,396	3,264	3,232	4,022	3,233

¹ Less than 1,000 cases.

Source: Official German and Dutch trade statistics.

In 1966, the government maintained an export subsidy for both fresh and canned peaches. It amounted to between \$0.004 and \$0.007 per pound (\$0.18–\$0.32 per case) and was paid only if the export price fell below a certain level, and if the exporter had paid the grower a specified minimum price. It was not learned how the export price level and the domestic minimum price were determined, nor how the subsidy was financed.

At the time of this interview, a special export promotion tax was applied to Greek imports and used for the promotion of Greek exports. This tax was added to the c.i.f. value of many Greek imports and amounted to 0.15 percent. However, it was not learned

if any of these monies were spent for promotion of canned fruit.

Domestic market

At the time of this survey, a domestic market for canned deciduous fruit was limited. Since this domestic market is primarily a fresh one (mainly because of price and consumer preference) its growth will depend on the production of a good product, at a cost within the public's range, as well as public education to its use. Some marketing techniques have been tried in the major population areas of Athens, Piraeus, and Thessaloniki, but until recently these were of limited success.

